



Desert Tortoises

Adoption & Care

Tortoise Group
Las Vegas, Nevada
Hotline: 702-739-7113
www.tortoisegroup.org

March 2007

ABOUT US

Since 1982, Tortoise Group has been a non-profit organization dedicated to protecting the wild tortoise, informing the public about the care of pet tortoises, and providing the public with educational programs and free, legally acquired tortoises for adoption.

Tortoise Group
5157 Poncho Circle
Las Vegas, NV 89119
(702) 739-7113
email: tortoisegroup@att.net
www.tortoisegroup.org

INFORMATION SHEETS

These Information Sheets describe special situations and helpful details about care. They are available on our Website or by mailing your request to Tortoise Group with a self-addressed envelope, one stamp for each group of four information sheets.

- 1 Avoiding Crowding and Planning for Compatibility among Your Tortoises
- 2 Determining the Age and Sex of Your Desert Tortoise
- 3 Measuring Tortoise Size and How Tortoises Grow
- 4 Comparison of Nutrient Value in Foods. Feeding Do's and Don'ts
- 5 Marking Your Tortoise
- 6 The North American Box Turtle – How to Care for It in the Las Vegas Area
- 7 Transporting Tortoises
- 8 Alternative Design for an Underground Tortoise Burrow
- 9 Considering Using PVC Pipe for Tortoise Burrows? Read This First.
- 10 The Aboveground Burrow
- 11 Keeping Records of Tortoise Behavior and Growth
- 12 Planting Prickly Pear Pads for Tortoises
- 13 Transplanting Dandelions
- 14 Burrows for Hatchlings and Juveniles up to 3 1/2" Shell Length
- 15 Alternative Location for Hibernation When an Outdoor Burrow is Not Available
- 16 Water Pavilion
- 17 Temporary Indoor Housing
- 18 Ticks on Tortoises
- 19 Growing Dandelions from Seed
- 20 Tortoises in the Classroom - Concerns and Alternatives
- 21 Plants to Grow for Tortoises
- 22 Gate Barrier Construction
- 23 Why We Don't Release Helium Balloons
- 24 Veterinarians Who Treat Tortoises in the Las Vegas Area
- 25 Drowning and Resuscitation
- 26 Salmonella

Photos by Tortoise Group members and friends

CONTENTS

THE LAW AND THE TORTOISE.....	1
Wild Tortoises	1
The Protected Tortoise	1
Why Wild Tortoises Should Not Be Removed from the Desert	1
Pet Tortoises	2
Tortoises Wandering in Developed Areas	2
Legally Obtaining a Tortoise.....	2
Unwanted Tortoises.....	2
Moving Tortoises	2
Why Pet Tortoises Should Not Be Released in the Desert.....	3
ADOPTION	4
Things You Need To Know	4
Things You Need To Do.....	5
HOW A TORTOISE WORKS	6
Balancing Sun and Shade.....	6
Why Not Indoors?.....	6
Area Needed.....	6
YARD PREPARATION.....	7
Escape-Proof The Yard	7
Securing the Fence	7
Installing a Gate Barrier.....	7
Eliminate Hazards.....	7
Tortoise Traps.....	7
Dogs, Cats, Fertilizers & More	8
Children.....	8
Fertilizers and Poisons	9
Male Tortoises.....	9
Select A Location For The Burrow	9
Underground Burrow	9
Dig The Burrow	10
Burrow Size and Roof.....	10
Marking the Ground.....	10
Making the Eave	11
Digging the Ramp.....	11
Making a Channel for the Tortoise	12
Covering the Burrow.....	13
Mounding the Soil.....	14
Covering the Eave	14
Creating a Berm	14
Aboveground Burrow	14
Burrow Problems	15
Check Inside the Burrow.....	15
Damp Burrow.....	15
Flooding	15

CONTENTS

Provide Water.....	15
How Tortoises Drink	15
Making a Drinking Place	16
FOOD AND FEEDING	17
Growing Food	17
MegaDiet.....	17
Food Problems	18
Foods to Avoid	18
Changing the Diet of the Lettuce Eater.....	19
REPRODUCTION AND HATCHLINGS	20
Mating Behavior	20
Hatchlings	21
Hatching.....	21
Hazards Unique to Hatchlings	21
Setting Aside Part of the Yard for Hatchlings	22
Building a Hatchling Enclosure.....	23
Hatchling Hibernation.....	24
Giving Away Hatchlings	24
HIBERNATION/BRUMATION.....	26
Location & Temperature	26
MEDICAL PROBLEMS	27
Accidents And Injuries.....	27
Respiratory.....	27
Gastrointestinal	27
HOW TORTOISE GROUP HELPS.....	28
Mission.....	28
Meetings And Services	28
Meetings.....	28
Marking Your Tortoise	28
Additional Free Services.....	28

Giving a tortoise as a gift?

Wait until after a holiday season or birthday to give or acquire a new pet. If you want to give a pet to a child, an adult must be involved even if the animal is meant for a child. Holidays usually mean more activities, visitors, and more noise, which is very stressful for a new pet. Household members tend to be too busy with the festivities or too distracted by them to provide the necessary attention and calm to help a new pet adjust. This effort by an adult is essential.

Housing and security arrangements must be prepared in advance for any new animal. Think of a gift certificate for a calmer time, after the festivities. This takes the surprise out of the event, but this approach is certainly more humane and responsible. Also, the child needs to understand the importance of preparation.

THE LAW AND THE TORTOISE

WILD TORTOISES

The Protected Tortoise

Wild and captive tortoises are protected in different ways by various local, state, and federal laws. Wild desert tortoises in the Mojave Desert, including Nevada, are on the federal list of Threatened and Endangered Species. Tortoises in Nevada are also protected under state law. Without a special permit, no one is allowed to touch, disturb, collect, or harm a wild tortoise or disturb a tortoise burrow. Tortoise remains are not to be collected. Tortoises, wild or domesticated, dead or alive, along with their eggs are not to be bought, sold, or taken across state lines without a state or federal permit.

A special permit has been granted by the U.S. Fish and Wildlife Service to Clark County, Nevada. Persons who file properly to develop private land may remove tortoises from those lands, but removal before development is now voluntary on the part of the developer. However, no tortoise is to be intentionally killed during development. They are to be collected and turned over to the Tortoise Pick-up Service, (702) 593-9027, not taken for personal use.

Why Wild Tortoises Should Not Be Removed from the Desert

It is against the law to collect a wild tortoise without a permit. Tortoises often cross roads through undeveloped desert. **They** know where they are going; they are not lost. There is no need to “rescue” them unless they are in danger from heavy or fast traffic. If it is safe for you to stop, approach the tortoise from the front, pick it up, hold it level and move it several yards beyond the side of the road or inside any fencing in the direction the tortoise was heading.

Wild tortoises tend to urinate when picked up because they are frightened. The tortoise has stored this water to use over many months. When you cause this water to be lost, the tortoise may die of dehydration before the next rain. So, think twice about moving a tortoise unless it is in immediate danger from vehicles.



Figure 1. Winter rain produced an unusual spring flowering for wild tortoises.

If you recently removed a tortoise from underdeveloped desert or a road through undeveloped desert, in Clark County Nevada, the first step is to call the Tortoise Pick-Up Service immediately, 702-593-9027. The U.S. Fish and Wildlife Service will be in charge of the eventual return of this tortoise to the desert. In other Nevada Counties or other states, contact the local U.S. Fish and Wildlife Service or the State Department of Fish and Game. You are not to release the tortoise or keep it for personal use. It's the law.

Keep the tortoise indoors until picked up. Put it in a box with solid sides **and a loose lid** so it cannot see out and one that is **tall** enough that the tortoise cannot climb out. Place it in a quiet spot. Do not place towels in the bottom, as the tortoise nails could get tangled. Check occasionally. The Pick-Up Service usually arrives within a few hours.

PET TORTOISES

Tortoises Wandering in Developed Areas

If you find a tortoise wandering in a developed area of Clark County, it may be an escaped pet or a wild tortoise that wandered off a development site. **Do not release it in the desert. Do not keep it for yourself or give it away.** Take it home, put it in a box inside your house away from dogs, and call the Tortoise Pick-up Service immediately, at (702) 593-9027. **The tortoise must be turned over to the Tortoise Pick-up Service. It's the law.**

*Tortoises may live
more than 70 years!*

If you put the tortoise in your yard it may quickly escape, become overheated, injured, or may die from any number of causes because your yard is not prepared with the special needs of a tortoise. Also, the owner may be looking for it and call the Tortoise Pick-up Service. If the owner does not claim it and it passes the health test, you may be able to adopt it after your yard has been prepared. Tortoise Group is authorized to guide you in preparing for and adopting these tortoises.

Legally Obtaining a Tortoise

In Nevada, in addition to adopting from Tortoise Group, you may accept a tortoise from another Nevada resident if it was hatched in captivity in Nevada or is assumed to have been in captivity since before August 1989 in Nevada. These tortoises do not have to be registered in any way.

Unwanted Tortoises

Tortoises adopted from Tortoise Group. Tortoises adopted from Tortoise Group are registered and tracked. Do not give your tortoise to another person. If you can no longer keep your tortoise, you must return it to us. If you move within Nevada, you may take your tortoise with you. However, you must notify us of your new address immediately.

Tortoises not adopted from Tortoise Group. If you did not adopt your tortoise from Tortoise Group and you cannot find a good home for it, the Tortoise Pick-up Service will take care of the tortoise until it can be placed in an authorized program such as adoption through Tortoise Group or translocation. Call the Pick-up Service at (702) 593-9027.

Hatchlings and large groups of juveniles from the same household. See *Giving Away Hatchlings*, Page 24.

*One cannot tell the age
of a tortoise
by counting
the rings on its shell.*

Moving Tortoises

No desert tortoise may be taken across state lines without a special permit from the Nevada Department of Wildlife (702-486-5127) and possibly the state where the tortoise is going. For their own sakes, tortoises should not leave the desert.

THE LAW AND THE TORTOISE

Why Pet Tortoises Should Not Be Released in the Desert

It's illegal. In addition to unauthorized releases being illegal, disease and parasites not obvious to owners may spread to wild tortoises, for example, Upper Respiratory Tract Disease (URTD), so common and often fatal in pet tortoises.



Figure 2. This juvenile is using a crevice as a burrow.

Rattles made from tortoise shells were often used in Native American ceremonies.



Figure 3. A vehicle traveling off the road collapsed this tortoise burrow.

Poor and decreasing habitat. One reason that the wild desert tortoise is listed as a threatened species is that natural habitat decreases each year in amount and quality because of human impacts such as development, mining, livestock grazing, and off-road vehicle usage. Because the desert recovers very slowly, even from small disturbances, degradation accumulates and the habitat supports progressively fewer animals.

*Tortoise
Flower munchers
Survivors of hot drought
Burrowing for mercy and life
Tortoise.*

T. J. Patceg

A major part of the wild tortoise diet is annual plants that germinate in winter **if** there is enough winter rain. To release additional tortoises into degraded areas, especially in years with little rain, increases competition for the limited food supply. As a result, when pet tortoises are released among wild tortoises, both wild and pet tortoises may suffer.



Figure 4. Desert dumping destroys tortoise habitat.

ADOPTION

The tortoise is a gentle animal that will roam your yard searching for flowers and tender shoots to eat. If you have never kept a tortoise, look forward to pleasant surprises, among them, more personality than you would expect from a reptile.

The tortoise spends a great deal of time in its burrow each day. It comes out to warm up enough to eat and explore, then escapes the heat of the day by returning to the burrow. In winter, the tortoise hibernates (brumates) in its burrow, usually from late October to mid March.

By reading this pamphlet carefully, you can find out in advance what is involved in having a tortoise. Many persons realize, after hastily accepting

a tortoise from a source other than Tortoise Group, that a tortoise is not the right pet for their family.



Figure 5. Healthy tortoises are available for adoption through Tortoise Group.

THINGS YOU NEED TO KNOW

- ◆ Tortoises for adoption are former pets. They have been legally acquired, not taken from the wild.
- ◆ Tortoises of all sizes must live outside. An average-size, fenced back yard of approximately 1250 square feet is needed (25' x 50'). Hatchling areas may be smaller, at least 100 square feet, but only for the first year.
- ◆ Teachers: Unfortunately, proper conditions for tortoises are not available in the classroom, but we do adopt to schools with suitable outdoor areas. You might prepare your own yard, adopt a tortoise, and take it to the classroom on occasion for a day. See Page ii for securing Information Sheet #20, *Tortoises in the Classroom – Concerns and Alternatives*.
- ◆ Tortoise Group adopts to the adults where the tortoises will live.
- ◆ There is no charge for adoption.
- ◆ A child should not be expected to assume full responsibility for care.
- ◆ Small tortoises, especially, are very appealing but are difficult to care for. From experience, we have learned that the death rate of juveniles is high, mainly as a result of living indoors and eating poor food.
- ◆ Various sizes are available (7"-12"). We recommend a large tortoise where there are small children.
- ◆ Salmonella infection is a potential threat. Wash hands after handling. See Page ii for securing Information Sheet #26.
- ◆ Adult dogs and tortoises usually get along well. But wait to adopt if you have a puppy. See *Eliminate Hazards*, page 7.
- ◆ We do not adopt if the tortoise can reach an unfenced pool or pond.
- ◆ We adopt American box turtles, when available. They are free, as is information on their care. They must live outside. See *Information Sheet #6*.

THINGS YOU NEED TO DO

First read from page 4 to the end of *Eliminate Hazards* on page 9 to understand the basic needs of tortoises. Then, if you want to go ahead with adoption, call (702) 739-7113. A member of the Adoption Committee will need to visit your yard **before** you start preparations. This will save you time and effort. We will suggest the best place for the burrow, and point out those things that you will need to do to make your yard ready such as:

- ◆ Dig a burrow for each tortoise. You may need to change your irrigation pattern to create a completely dry area at least 15' x 15' for each burrow.
- ◆ Make your yard escape-proof.
- ◆ Remove hazards.
- ◆ Provide a water dish and make a cover for it, if necessary.

- ◆ Plant a patch of grass, with dandelions (highly recommended).
- ◆ Plant several of the ornamentals that tortoises eat and we suggest.
- ◆ Feed the tortoise MegaDiet, the tortoise chow we recommend.

If you have a female tortoise and want a second tortoise, we may be able to adopt a second female to you. A visit to your yard will be necessary. In keeping with our birth control policy, we will not adopt to create a mating pair now or eventually. For homes with no tortoises, we adopt only one or two females, one male or one immature tortoise. If you have a tortoise, we can offer suggestions, whether or not you adopted from us. Our consultation visits to your yard are free.



Figure 6. Backyard designed around a tortoise – dry area for burrow (left), shallow walk-in water feature, plants and grass for browsing.

HOW A TORTOISE WORKS

BALANCING SUN AND SHADE

The area you set up for your tortoise must provide the range of temperatures that the active tortoise needs to warm up and cool off throughout the day. One of the tortoise's major adaptations to living in the desert is not a tolerance of heat but the ability to dig a burrow and get out of the heat. The tortoise regulates its temperature by moving to places in its environment that provide the desired effect. Basking in the sun to warm its body is necessary to support activities such as foraging and digestion; therefore, sunshine should be available most of the day.

To prevent overheating, the tortoise moves to a place where the temperature is cooler than its body. This place may have to be cooler than any aboveground shade. Such a place is an underground burrow, where a tortoise spends about 98% of its time. A snugly fitting burrow is vital to restrict air flow and help the tortoise maintain proper body temperature. Since one tortoise cannot pass another in a snug burrow, each tortoise must have its own burrow. Otherwise, one tortoise might be forced to remain too close to the opening for adequate protection from the heat or cold. Dog houses, sheds, and children's wading pools do not protect a tortoise in our desert.

WHY NOT INDOORS?

If you force your tortoise to remain indoors most of the time, particularly if the tortoise is young, you are risking its health and life. Artificially supplying the needed ultraviolet B and maintaining the proper temperature range requires special attention, and **a box or terrarium is too small for a desert tortoise of any size.**

Unfortunately, it may take months or even several years for the results of improper housing to become obvious to you.

A sunny window indoors will become too hot, and ultraviolet B needed for proper growth does not pass through common window glass. Setting the tortoise outside for a few minutes each day will not satisfy the needs of the animal and may result in death from overheating.

The desert tortoise is native to our local desert. It is logical and easier in the long run to take advantage of the available climate. Provide an adequate outdoor habitat and your tortoise will respond naturally to whatever the weather offers. What makes your tortoise so interesting is watching it in outdoor surroundings through the seasons.



Figure 7. Basking raises body temperature to allow moving about, digesting food, and finding a mate.

AREA NEEDED

Tortoises, even hatchlings, need more area than most people realize. The wild adult tortoise may use 100 acres or more. Give the entire yard to your tortoise if you can. A large area will reduce stress on your tortoise and will be much more interesting for you as you see how the tortoise uses different parts of the yard through the seasons.

YARD PREPARATION

ESCAPE-PROOF THE YARD

Securing the Fence

To make your yard escape-proof, fencing is necessary. **Never tether a tortoise!** A tortoise will try to get through a fence if it can see through or under the fence. At most, this may lead to escape, injury, or death, and at the least to constant fence pacing, frustration, and stress.

To eliminate the hazards from any fencing that a tortoise can see through (such as chain link), including fencing around your pool, install a permanent, secure, continuous, 18-inch-high baseboard. A tortoise should not be able to climb over or see under or through it. Where there is a wood fence, you will need to secure boards so they overlap the bottom of the fence and continue into the ground a few inches. No light should show through. This discourages digging out.

Installing a Gate Barrier

A barrier across the gate opening is very important. Install an 18-inch high barrier across the base of the gate opening so that, when the gate is open, the tortoise cannot see through or pass through the opening and people can easily step over the barrier. See Figure 8.

Our recommended design allows the barrier to be slid up and removed if a large or heavy item must go through, but it must be replaced immediately. Wood merely pressed against the gate opening tends to fall from wind, a caught toe, or a hasty gesture. The wood should rest on a brick or concrete footing so no light shows through under the base of the barrier and the tortoise cannot dig out. This barrier is vital to prevent escape when you are using the gateway or if the gate is accidentally left ajar. See Page ii for securing Information Sheet #22, *Gate Barrier Construction*.

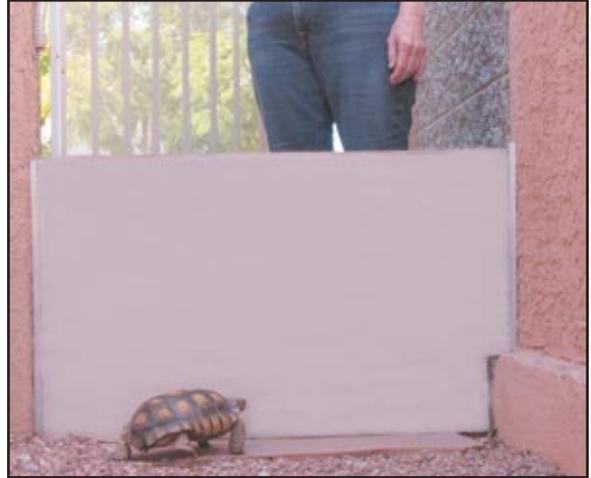


Figure 8. Gate barrier can be removed for lawn mowers, garbage cans, etc. A tortoise can't dig under or escape if the plywood rests on concrete.

ELIMINATE HAZARDS

Tortoise Traps

You may be surprised by the trouble a tortoise can get into. Unlike cats and dogs, the tortoise cannot cry out when stuck, hurt, or in a life-threatening situation.

Items along edges. A tortoise likes to walk the edges of the property. It will attempt to climb over items in the way and may get caught or accidentally tip over on its back.

More trouble spots anywhere in the yard. A tortoise may tip over when climbing on stored items, wood piles, wire mesh, and odds and ends. Cycles and power equipment are especially dangerous when stored on concrete. An overturned tortoise usually cannot right itself on concrete or other hard surfaces and may die of overheating.

Walls made of keystone blocks provide toe holds that allow a tortoise to climb. The tortoise may fall back when climbing, or once at the top may be unable to climb down and become stranded in the sun. The attempt to climb down may end in a fall. See Figure 9 .

YARD PREPARATION



Figure 9. Tortoises can climb and fall from Windsor blocks. They are dangerous.

Swimming pools and fish ponds must be fenced if the tortoise has access. A wrought iron fence is not enough. The bottom 18" must be covered with a firm, smooth material that prevents the tortoise from seeing through or climbing. A tortoise can climb a rock wall surrounding a pond.

Tortoises do not swim or float for long if they fall in a pool. If this occurs and the tortoise appears to be dead, it may still be alive. Be prepared in advance. See Page ii for securing Information Sheet #25, *Drowning and Resuscitation*.

Eliminate tortoise traps by putting them out of the tortoise's reach or surrounding them with an 18" upright barrier with a smooth face that the tortoise cannot climb, see through, or knock over. Stack the wood pile so the sides are vertical, too steep to climb. To prevent collapse if a tortoise burrows under stacked wood, support the stack on at least two pieces of lumber that run from one end of the stack to the other.

Dogs, Cats, Fertilizers & More

The family dog. Expect the family dog to be curious, jealous, aggressive, or playful. Any of these responses may lead to the death of the tortoise or its being continually stressed. **Do not trust**

puppies with tortoises. Even an older dog that is gentle with people can severely injure or kill a large tortoise in a few minutes. You should be prepared to watch constantly, until you know whether or not the dog can be trusted.

How to introduce a dog. Let the dog smell the tortoise thoroughly. Reassure the dog of your affection during the initial encounters. Let the dog help you find the tortoise and praise the dog for doing so. Also let the dog know, in a kind but firm manner, that certain behaviors are not allowed: shoving, picking up, licking the face, and continually causing the tortoise to pull in its head when the dog approaches.

With a little concentrated attention from you during the first few days, the dog should satisfy its curiosity, learn from you the behavior that is not allowed, and that there is no reason to be jealous. This is important if the dog is to be trusted when you are not home.

The dog may become very protective of the tortoise or may lose interest entirely. However, some dogs continue to want to play with or gnaw on the tortoise, particularly if the tortoise is small. Be prepared to give up the tortoise if this happens.

Visiting dogs. If you are caring for a friend's dog or friends come with their dog to visit, watch it carefully!

Cats. A cat may be playful with a hatchling and flip it over. Typically a tortoise is not active enough to hold a cat's interest for long.

Children

Handling by a small child can be injurious or stressful to a tortoise. The shell of a tortoise may break if dropped. A child should be willing to enjoy watching how the tortoise spends its day, rather than carrying the tortoise about. **If it is necessary to pick up a tortoise, hold it in the same position as it stands. Support the feet.**

YARD PREPARATION



Figure 10. Move a tortoise by approaching from the front, holding it level. Support the legs and feet to carry it for longer distances.

Fertilizers and Poisons

Dry fertilizer can be hazardous. Tortoises may accidentally eat it while grazing or may drink it in solution from puddles at the base of shrubs. We suggest you use liquid fertilizer (such as *Miracle-Gro*) when tortoises are active. Do not use snail bait, weed or pest sprays, or systemic poisons.

Male Tortoises

If you have more than one adult male tortoise, don't expect them to get along. Fighting will probably occur because most yards are too small for more than one male. Fighting can lead to injury, death, or constant stress. The situation may never change as long as the two can reach each other, so they must be permanently separated. Females seldom fight.

SELECT A LOCATION FOR THE BURROW

Underground Burrow

Do not expect a tortoise to pick the proper place for a burrow. In fact, your tortoise may not attempt to dig a burrow or, because of the caliche layers and compac-

tion, the tortoise may not be able to dig to an adequate depth. The place the tortoise chooses to dig may not be safe or healthy, such as where the soil is damp, against a fence, or under a woodpile that may collapse. In almost all cases, **you** should choose the place and **you** should dig the burrow.

- ◆ Find or create a dry area that is at least 15' x 15'. This area will provide the needed dryness in the burrow plus a dry margin all around it that is 5' from any major drainage way, pavement, soil where rain drains off the roof or any plants that are irrigated, including with a drip system. Only rain directly from the sky should fall on the burrow. Damp soil is unhealthy for the tortoise. **The inside of the burrow must remain dry.**
- ◆ Tortoises are natural burrowers. Expect your tortoise to lengthen its burrow. So, if the burrow must be dug near a wall, it should be at least 5' away and either parallel to it or the opening should face the wall. This way as the tortoise lengthens the burrow, it will extend into your yard and you will have control of the soil over it. If the burrow were to extend under your fence and into your neighbor's yard, the burrow might run into wet soil. You can't control your neighbor's irrigation, digging, or the digging of their dog.
- ◆ Try not to have the opening face north, northwest, or west, where the setting sun will shine into the burrow in summer. The burrow should not face uphill. If you are digging more than one burrow side by side, the long sides should be parallel and at least 3' apart.

YARD PREPARATION

DIG THE BURROW

- Keep this pamphlet with you to follow the step-by-step instructions.
- Expect to spend several hours, even a whole day, on this project. Before you cover the burrow, a member of Tortoise Group needs to check it.

Burrow Size and Roof

See Table 1 for the size burrow and plywood you will need for the size tortoise you want or have. To support the roof soil, use a sheet of $\frac{3}{4}$ " CDX plywood. Do not use pressboard, particleboard, or one or more pieces of plywood thinner than $\frac{3}{4}$ ".

Table 1. Burrow and Roofing Dimensions for Tortoises of Various Sizes						
To measure tortoise size, back the tortoise against a wall and lay a ruler down the middle of the shell.						
If you are making a burrow for a juvenile, you may want to use plywood with the next larger dimensions. This will save having to replace the plywood (as often) as the tortoise grows.						
(Dimensions are in inches.)	Shell Length	Burrow Channel			Size of $\frac{3}{4}$ " plywood	Depth at end of ramp
		Width	Depth	Length		
Hatchling and Sm. Juvenile	1 $\frac{3}{4}$ - 3	See page 23 for making a hatchling burrow.				
Large Juvenile	4 $\frac{1}{2}$	4 $\frac{1}{4}$	2 $\frac{3}{4}$	24	36 x 48	12
	6	5 $\frac{1}{4}$	3 $\frac{1}{2}$			
	6 $\frac{1}{4}$	5 $\frac{1}{2}$	4			
Subadult	6 $\frac{1}{2}$ - 8	7 - 8	5	60 - 72	36 x 96	20
Adult	8 $\frac{1}{4}$ or more	9 - 11	7	60 - 72	36 x 96	20

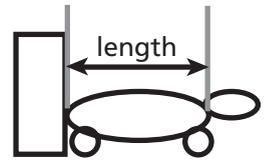


Figure 11. Markings must be visible until the burrow is complete.

Marking the Ground

Assure a tight fit of the plywood by carefully marking the ground. **Do not skip this step!** First mark the front edge of the burrow with four stakes.

1. Lay the plywood on the ground where you plan to dig the burrow.
2. Firmly pound stakes at the two front corners (front is the side with opening).
3. Extend the line at least two feet beyond the plywood in both directions, and pound in stakes at both ends.

YARD PREPARATION

4. Tie the light rope to one of the far stakes. Keeping it taut and at ground level, wrap it around the base of the other 3 stakes, and tie it off.

an adult burrow. We have found it worth the rental cost in caliche soil. Do not use water to loosen soil.

Making the Eave

1. Carefully slide the plywood forward squarely across the rope. If the plywood is:
 - 8' long, slide it forward 15"
 - 4' long, slide it forward 10"
 - 2' long, slide it forward 4"When the burrow is finished, the wood will create an eave over the opening by sticking up above ground level. See Figures 12 and 16.
2. Pound in stakes at the rear corners of the plywood.
3. Run the rope tightly around the 4 main stakes to outline the remaining 3 sides of the board.
4. The outline within which you will dig is finished. Set the plywood aside.

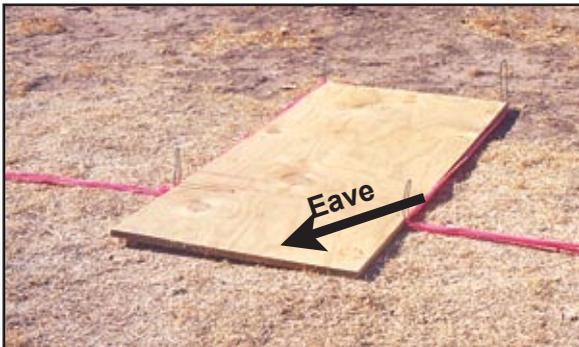


Figure 12. An overhang eave protects the burrow opening from rain and sun.

Digging the Ramp

The ramp will become the shelf on which the plywood roof rests. See Figures 13 and 14. Rent a small electric “soil breaker” (available from Home Depot) to cut the digging time almost in half, to about 4 hours for

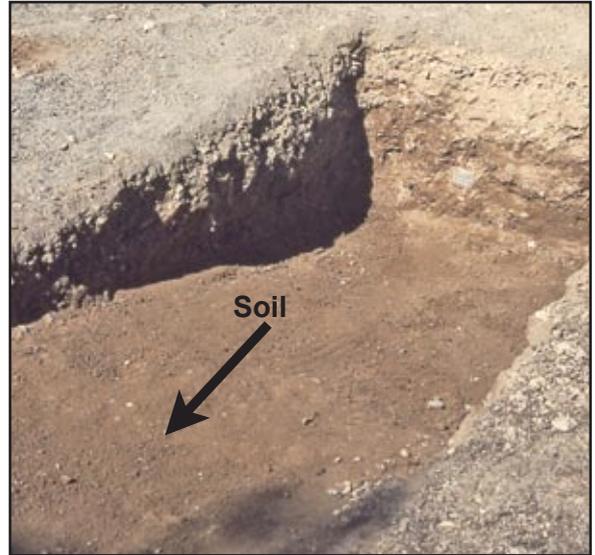


Figure 13. The smooth, rock-free ramp slopes down gradually.

1. Start digging at what will be the deep end and work to the front. See Table 1 for how far down to dig for plywood of different lengths. Stay just inside the rope line.
2. Create a smooth, even, and very gradual ramp from the deep end to the rope at the front. It is important to dig gradually, not too deep. Once you break the soil, it will not support plywood that will eventually rest on the outer edges of this ramp. The ground must be kept firm for support.

- ◆ There will be room for only one person to work.
- ◆ Do not consider using cement blocks, pieces of wood, or boulders to support the plywood. Tortoises tend to dig under such things, allowing the roof to settle and pin down the tortoise or allowing the supports to tip over and obstruct the channel.

YARD PREPARATION

- ◆ Occasionally, because of loose soil, the walls collapse as you dig. If this happens, follow the directions on Information Sheet #8. Then skip to Page 13, *Loosening the Floor*.
3. Check for snug fit of the plywood on the ramp occasionally. Always slip in the plywood from the front, not from above. At first you may find it easier to use a length of 2" x 4" that is as long as the width of the plywood.

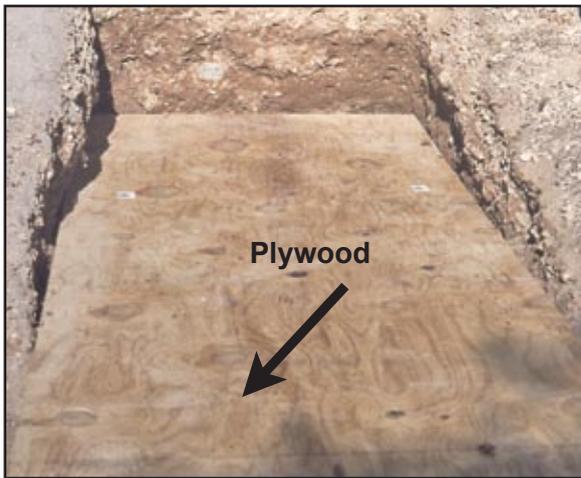


Figure 14. Plywood should rest tightly along the length and edges of the ramp.

4. When the ramp is done, the surface should be smooth and rock-free, and about 15-20 degrees below horizontal ground level. See Figure 16. The plywood should just fit. Stand on the wood. If it rocks in any direction, remove ridges and fill depressions until the plywood rests tightly along the entire length. If the surface is not smooth, the plywood will eventually sag and may pin down the tortoise.

At the front end of the burrow, the plywood sloping up from the bottom should touch the rope as it crosses it and then project above ground. Note: This step will make sense when you reach this point.

Making a Channel for the Tortoise

The channel is the underground area where the tortoise spends most of his time. See Table 1 for the dimensions and Figure 15 for how the channel should look when you finish. Figure 16 is a side view of a completed burrow, showing that the **plywood is the same distance above the tortoise all the way along the burrow channel**. The channel should be only slightly higher and slightly wider than the tortoise. The tortoise should not be able to turn around in the channel except at the far end. This snugness provides insulation and keeps air circulation at a minimum.

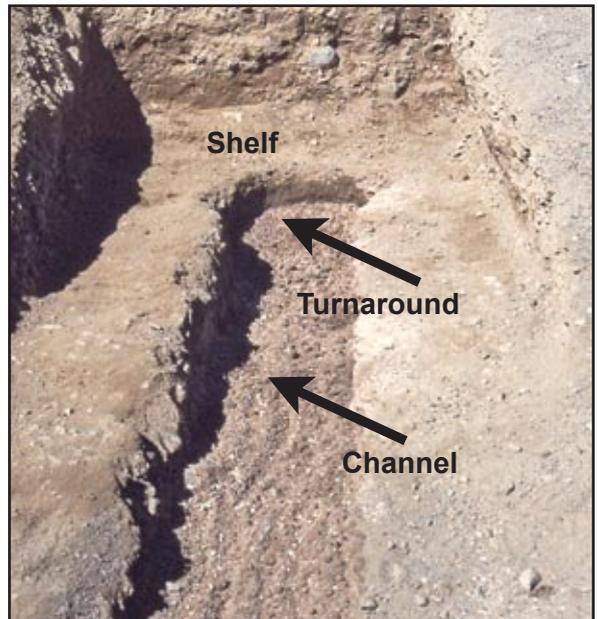


Figure 15. Channel must fit tortoise snugly except at the far end that widens for turning around.

1. Make a rear shelf for the plywood. For a tortoise 6 ³/₄" or longer, leave 12" of the ramp as the rear shelf for the plywood. For smaller tortoises, leave whatever remains after you have measured how long the burrow channel is to be, measuring from the front end.

YARD PREPARATION

2. Dig the channel starting at the front end within the rope line. As you dig, do not stand on the ramp that is becoming the shelf for the plywood. It is very likely to collapse and not be repairable.
3. When the channel is finished, widen it slightly at the deep end so the tortoise can turn around. See Figure 15. Note that the floor of the channel is flat, not curved.
4. Replace the plywood. Have one person stand on it and another look into the burrow. No light should show through the cracks. If it does, make the necessary adjustments.
5. If you already have a tortoise, put it in the turn-around, slide in the plywood, and make sure the tortoise can turn around and leave the burrow, just clearing the top and sides. Add or remove soil in the channel for the proper fit.

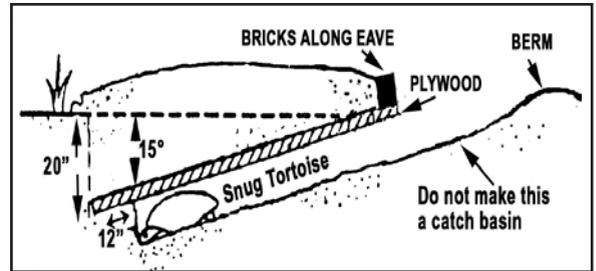


Figure 16. Cutaway of burrow showing channel slope and snug fit.

Covering the Burrow

If you are adopting from Tortoise Group, an Adoption Committee member must approve the burrow before you cover it. In hot weather, to trap the least amount of hot air and soil in the burrow, allow the burrow to remain uncovered the night before you plan to cover it. Begin to cover the burrow as early as possible the next morning, preferably before sun-up.

Purpose of the soil mound. The mound of soil over the plywood 1) insulates the tortoise from the extreme aboveground temperatures and 2) helps to prevent the burrow from flooding in heavy rainfall. So, the soil that covers the plywood should have as much water-holding capacity as possible. If more soil is needed to create the mound, do not use gravel or washed sand, because the water will drain right through it. In the Las Vegas area we can recommend a place that sells soil with high water-holding capacity (high clay content).

Loosening the floor. The last digging in the burrow is to loosen the soil in the floor of the channel to a depth of 6". The loose soil allows the tortoise to adjust the fit. Also, it is important for females who dig their nests in the burrow floor or just outside the opening. A rock on the floor of the channel could pin the tortoise to the roof and not allow it to move.

1. Start at the turn-around and finish about 10" beyond the burrow opening.
2. Crush lumps of soil, and remove roots and rocks larger than 1/2" in diameter. When you finish, the sides of the channel should be the same depth as when you started, as in Table 1.
3. Cover the excavation at ground level with the plywood until an Adoption Committee member checks it.
4. To keep the entire inside dry, cover the wood and beyond with a plastic sheet, like a painter's drop cloth. Weight it down in several places so it will not blow loose. This should be done each time you finish digging for the day. It may take several days. If the interior becomes wet, you may have to wait weeks until it dries before covering it and letting a tortoise use it. A waterproof cover on the pile of soil that will cover the plywood is a good idea, too.

YARD PREPARATION

Mounding the Soil

1. Slide the plywood into place.
2. Shovel soil onto the plywood, packing it down as you go.
3. Remove rocks that are more than $\frac{1}{2}$ " in diameter and pack the soil very firmly and continually as you cover the plywood, as in Figure 17.



Figure 17. Mounded, packed rock-free soil helps keep out the rain.

4. When the excavation becomes filled to ground level, continue adding soil to create a mound above ground level. Allow the soil to extend onto firm, unexcavated ground for several inches. This helps to “seal” where you cut the surface.
5. Grade the surface of the mound so rain will not puddle on it. Add gravel only after the burrow mound is completed. Do not put any waterproof material or a roof over the mounded soil. It will make the burrow hotter.

Covering the Eave

Place stacked flagstone or bricks along the eave and pile soil behind them to protect the plywood and keep the soil and the tortoise from falling into the burrow opening. Never use small rocks that the tortoise could knock into the burrow opening. The level surface of the eave allows the tortoise to

walk safely without slipping and falling into the burrow opening upside down (Fig. 18).

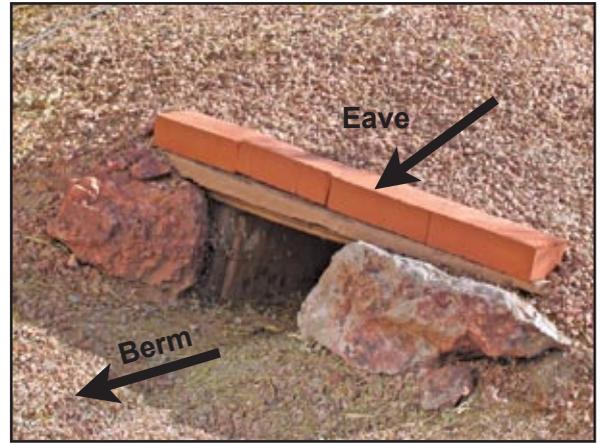


Figure 18. Berm allows water to flow away from burrow opening.

Creating a Berm

In front of the entire burrow opening, make a ridge of soil to help keep out flowing water. If built correctly, the tortoise will go up the outside of the berm and down the inside, directly into the burrow, as in Figure 18. There should be no depression in front of the burrow.

ABOVEGROUND BURROW

The aboveground burrow does not insulate the tortoise as well as one below ground so a dry, shaded area is a must. The burrow is built of cinder blocks with a plywood floor and ceiling. Soil is mounded at the sides and on the top to provide the necessary insulation.

Figure 19 shows an aboveground burrow. On the left the burrow is completed except for the covering soil. The right shows the rear view when the burrow is completed. This type of burrow will be at least 4' high and at least 10' x 6' at the base. See Page ii for securing Information Sheet #10, *The Aboveground Burrow*.

YARD PREPARATION



Figure 19. Aboveground burrow. (Left) Front view of completed structure shows opening. (Right) Rear view shows one foot of soil covering structure for adequate insulation.

BURROW PROBLEMS

Check Inside the Burrow

To see inside the burrow during the day, use a mirror to reflect sunlight into the burrow. At night, use a flashlight.

Damp Burrow

Damp or caked soil on your tortoise indicates a damp burrow. Check for flooding during heavy rains, summer and winter. If the burrow is flooded or muddy, remove the tortoise and expose the interior of the burrow to dry, winter or summer.

If the tortoise has dug beyond the plywood roof, the soil may have become saturated with rain and collapsed of its own weight covering, trapping, and smothering the tortoise. Make sure you can see the tortoise.

If you can't see the tortoise, call us to locate your tortoise with the Snooper, our Burrow Probe video camera that uses infrared light.

Flooding

If flooding occurs in winter the tortoise, being asleep, may drown. If the burrow floods or collapses in winter, see [Substitutes for an outdoor burrow under Hibernation](#), Page 26.

Rarely is flooding caused by water

running into the burrow opening but rather from rain-saturated soil around the burrow draining into the space occupied by the tortoise.

If flooding occurs when the days are hot, make sure there is a cool place for the tortoise during the heat of the day until the burrow is dry or you build another.

*The Mojave Tortoise has been here
over 2,000,000 years,
originally living in moist woodland.
The Mojave Desert did not form
until about 4,500 years ago.*

PROVIDE WATER

How Tortoises Drink

You never know when a tortoise needs a drink, so keep fresh water in a shallow, shaded dish at all times. A tortoise drinks by immersing its mouth and nose and swallowing repeatedly for as long as 15 minutes. Don't be alarmed.

Tortoises often urinate during or after drinking or eating. Along with watery urine, they may pass a white-to-lavender substance. See Figure 20. It may look gritty or like curdled milk. This is normal. Flush the urine from the water dish immediately. If on grass, hose it well into the lawn.

YARD PREPARATION



Figure 20. Normal urine liquid may contain whitish solids.

Making a Drinking Place

The water dish should be at least 5' from any part of the burrow. Do not put the dish where parts from plants will fall in the water. Use a new, red clay dish glazed or unglazed, like those put under flower pots (no plastic). The dish should be wide enough for your largest tortoise to get in and soak, and about 1 1/2" deep. If the water would be over the heads of your smaller tortoises, cover the bottom with pebbles or pottery shards.

To catch rain, wild tortoises dig depressions in the soil. They wait by the depressions when it looks like rain in hopes of getting a drink before the soil absorbs the water.

Surround the dish to about one foot out in all directions with stepping stones, bricks, or ornamental rocks so the lip is flush with them. If you tilt the bricks slightly away from the dish, mud and debris will flow away when you flush it.

The growth of green algae that appears in the dish helps to aerate the water. There's no need to remove it. To fill or clean the dish, leave it in place and flush it with a hose or bucket.



Figure 21. Rolling back the water pavilion cover makes flushing the water dish easy.

Water needs permanent shade. Uncovered, if it is shallow enough to be safe, it may become too hot to drink. A 4' x 4' cover with 10 1/2" legs will shade the water no matter where the sun is. The cover should keep out poisonous leaves that may fall from above it. Secure Information Sheet #16 with instructions for putting together a water pavilion covered by either shade cloth or reed mat. These materials allow hot air to escape.



Figure 22. Shade cloth or bamboo reed provides cover that allows hot air to escape.

GROWING FOOD

The tortoise is a vegetarian, but it is not practical to duplicate the wildflower diet of the wild tortoise and the average back yard does not provide an adequate diet. Therefore, you should make a conscious effort to ensure proper nutrition from other sources, particularly for young tortoises.

Tortoises naturally forage, so providing growing food is important. Common Bermuda grass is preferred. Tortoises usually do not eat hybrid Bermuda grass. Plant a patch of at least 9 square feet. Keep grass as short as you can without its burning. Long grass can cause choking. Transplant dandelions throughout the grass, as they are one of the most nutritious plants you can offer. The yard must be free of weed and pest killers. See Page ii for securing Information Sheet #13, *Transplanting Dandelions* and #19, *Growing Dandelions from Seed*.



Figure 23. Flowers are an important part of the tortoise diet.

Ornamentals. Some of the ornamentals that tortoises eat include gazania, Mexican evening primrose, verbena, ivy geranium, hollyhock, rose petals, Hall's honeysuckle, young grape leaves, desert willow flowers, petunia, and the young pads of spineless cactus, *Opuntia ficus indica*. Hefty cactus

starts producing these young pads are available free from Tortoise Group. See Page ii for securing Information Sheet #12, *Planting Prickly Pear* and #21, *Plants to Grow for Tortoises*.

Poisonous plants include Chinaberry tree (*Melia sp.*) leaves and fruit, tomato plants, rhubarb leaves, and oleander.

MEGADIET

MegaDiet is Tortoise Group's name for Zeigler Brothers' tortoise diet mix. Using MegaDiet and growing food simplifies work, saves time, and provides a nutritionally complete diet. MegaDiet is an inexpensive, easy-to-use tortoise chow.

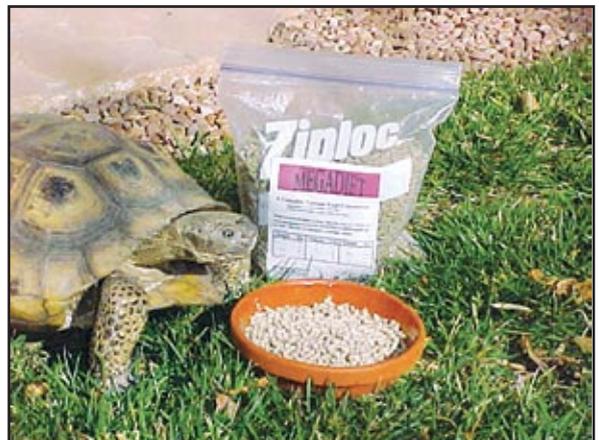


Figure 24. MegaDiet dry pellets require a shady location during the day. Bring in MegaDiet at night – cockroaches love it!

MegaDiet is not a supplement. It is a complete food formulated for tortoises by nutrition specialists at the Smithsonian Institution National Zoo. In addition to the growing plants we recommend, offering this all-in-one food ensures that your tortoise receives all the needed nutrients and fiber. With MegaDiet, **no vegetables are needed.** Adding supplements can be harmful, not helpful.

FOOD AND FEEDING

A salad of only vegetables, even with added vitamins and minerals, is not nutritionally complete.

If you are using vegetables, hard vegetables need to be shredded because a tortoise does not chew its food; it bites and swallows. Chunks of food can cause choking or injury to the cutting edges of the beak.

MegaDiet can be purchased from Tortoise Group at convenient locations around Las Vegas. Call (702) 739-7113. MegaDiet is sold at some PetsMarts as MonsterDiet for Tortoises. MegaDiet comes in small pellets that should be softened with water for tortoises less than 3 ½" in shell length. With MegaDiet there is no salad to spoil or attract ants. Dry pellets can be set out in a small dish in a shaded dry place. Bring it in each night; cockroaches just adore it!

Offering moist food. Wait until your tortoise is walking about before you put out food. It may first have to bask in the sun. Do not pull the tortoise from its burrow to feed it, especially in the heat of the day. Preventing overheating is more important than eating. In hot weather, your tortoise may not come out for several days at a time.



Figure 25. Soften MegaDiet for tortoises under 3 ½" long. Start larger tortoises on softened pellets, also. Remove uneaten food immediately – ants love it, too!

A tortoise may eat more than one helping of prepared food in a meal and more than one meal a day. If you have more than one tortoise, feed them several feet apart from one another to avoid competition. Some tortoises become dependent on salad mixes, so make sure that the tortoise does some foraging on its own. This way you will know that the tortoise will eat the growing food you provided. This is important if you go away for a few days.

Feeding hatchlings. A newly hatched tortoise has not developed the bad habit of eating a vegetable salad and should not be offered vegetables. Offer only softened MegaDiet and have available many of the ornamentals we suggest, especially dandelions. The hatchlings seem to know that they are a very nutritious food. Because young animals tend to eat small amounts and often, having the fresh growing food available is very important, especially if you are not home most of the day.



Figure 26. Cactus pads are hard to eat unless held down. A pebble props up each pad for easy eating.

FOOD PROBLEMS

Foods to Avoid

Lettuce. Tortoises will accept many grocery store vegetables but, if allowed, tend to eat lettuce only. There is no reason to offer **any** kind of lettuce. A

FOOD AND FEEDING



Figure 27. This tortoise was fed only lettuce and kept indoors. The collapsed shell shows lack of calcium. Reversing the effect may not be possible.

tortoise cannot get the nutrients it needs no matter how much lettuce it eats. Even Romaine lettuce is mainly water.

Lettuce provides water, but also adds potassium, which can build to toxic levels as bladder water passes back into the system carrying potassium with it. At some point, tortoises need to have water that is not attached to a plant. It is the **drink** of water that helps the tortoise flush the bladder and rid the system of excess potassium. As a result of lettuce diets, deficiencies and deformities are common. Even nutritious vegetables are about 86% water.

No dog or cat food. They may cause digestive problems because the fiber content is too low for tortoises. The pellets are hard and may injure the tortoise's beak.

No canned foods. Most have lost valuable nutrients and are high in sodium.

No frozen foods. These foods often have added sodium and have lost nutrients. They are rubbery and hard to eat, especially for small tortoises. Foods should be raw.

Avoid spinach, beet greens, and chard which bind the calcium in the food and make it unavailable to the tortoises. Tortoises need lots of calcium. Too much broccoli, collards or kale depresses the thyroid.

Avoid commercial mixtures developed for other turtles.

Foods with virtually no merit include celery, cucumber, cabbage, tomatoes, and all varieties of lettuce.

Sweet fruits. Do not offer sweet fruits or corn. Sweet fruit is not a natural part of tortoise diet, and the **sugar predisposes the tortoise to intestinal parasites**. If you have fruit trees, try to keep fruit picked up and away from the tortoise.

If you continue to offer vegetables, see Page ii for securing Information Sheet #4 to read about the nutritional value of common vegetables. Adding vegetables to MegaDiet may disrupt the natural balance of nutrients in MegaDiet and dilute the meal.

Changing the Diet of the Lettuce Eater

If your tortoise will eat only lettuce, immediately stop feeding all kinds of lettuce and start offering the recommended foods. Be patient. The tortoise will not starve before accepting nutritious food if you have grass, dandelions, and the ornamentals that we suggest. You might take the tortoise to a vet. See page ii for securing Information, Sheet #24, a list of local vets. There may be deficiencies you need to start correcting aggressively.



Figure 28. This tortoise from Figure 27 is the only one of a clutch of four that recovered. Even with intensive nursing care and MegaDiet, the other three died.

REPRODUCTION AND HATCHLINGS

MATING BEHAVIOR

Tortoises are natural loners. They do not need other tortoises for “company.” In fact, in the average size yard, because the female cannot get away from the male, the constant courting of a male may be very stressful and debilitating for a female.

Reproductive readiness is determined by size rather than age. Females are usually ready when the length of the carapace (upper shell) is about 7- 8". The number of years for a tortoise to reach this size depends upon how well it eats. A wild tortoise may be 15-20 years old before it breeds, a well-fed pet, half that age. See Table 1 for how to measure tortoise size.

Sexual differences become quite evident when the shell is about 7" long. Until that size, the plastron (lower shell) of both sexes is flat. Males begin to develop a concave plastron near the tail. A female's plastron remains almost flat throughout life. See arrows in Figure 29.

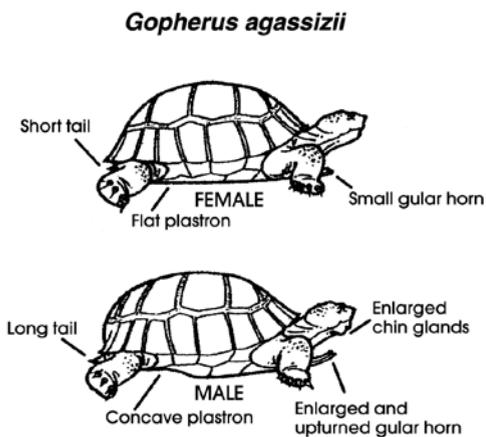


Figure 29. The gular horn under the chin becomes longer and more upturned in the male. He also develops an enlarged gland on each side of the lower jaw and a concave plastron near the tail. The female has a shorter tail and longer rear nails.

Drawing provided by Leo Nowak, Desert Tortoise Preserve Committee

Courtship and mating may occur any time that tortoises are not hibernating. Typically, the male bobs his head at the female and nips at her front legs and the front edges of her shell. This usually makes her stop and pull in her head and limbs. The male then moves around to her rear and mounts. See Figure 30. This differs from fighting, where in tortoises try to flip one another over.



Figure 30. Mating occurs any time other than during hibernation. Females store sperm and may lay fertile eggs for several years after separation from a male.

Nesting. Eggs are usually laid from early May to mid-July. Two clutches may be laid several weeks apart. The incubation period is about 90 to 120 days, depending upon the temperature in the nest. Using her hind legs with their long nails, the female digs a nest, a shoe-shaped hole about 4" deep. The nest is often inside the burrow. Nesting takes several hours.

Eggs. The number of eggs tends to be greater the larger the female. A typical clutch from a wild female is 4-8 eggs, but pet tortoises tend to grow larger and may

REPRODUCTION AND HATCHLINGS

lay 12 or more. Usual is 6-10. Eggs are hard-shelled, slightly oblong, dull white, and almost the size of ping-pong balls. After laying, the female carefully covers eggs using her hind legs. Sometimes she remains as protection, but she soon walks away and shows no further interest in the nest or the hatchlings.

If your tortoise digs several partial nest holes and does not lay eggs, the soil may be too hard or she may be egg-bound. Take her to the vet for X-rays and treatment.



Figure 31. This yearling hatched from a ping-pong sized egg.

HATCHLINGS

Hatching

Hatching occurs between late August and early October. After cracking the egg, the 2" hatchling usually remains underground for a few days. During this time the yolk sac that protrudes from the lower shell shrinks and dries within the safety of the nest. By the time you see the hatchling walking about, there should be only a slightly raised "belly button" where the yolk sac was.

*The Desert Tortoise is the
Nevada state reptile.*

The almost boneless shell is very soft, yet the hatchling is ready to live outdoors on its own without parental care. The desert tortoise is adapted to the desert climate. Your hatchling, too, should live outside to develop properly. **If you create a good outdoor habitat for your hatchlings, they should thrive.**

Hazards Unique to Hatchlings

If you plan to keep any hatchlings, **prepare your yard for them before August.** The babies will need adequate shelter from the heat as soon as they hatch. Hatchlings will use the entire yard, so reconsider possible hazards in terms of the small size of hatchlings. See *Eliminate Hazards*, Page 7.

Escape. Tortoises will stand on their hind legs to get through cracks.

Vertical drops greater than the tortoise is long, like tree wells and grass edges, may cause the tortoise to tip over.

Grass. Hatchlings have a hard time walking on grass and may become exhausted and stranded on the lawn. Death from overheating may soon follow. To give small tortoises easy access to growing food, water, and their burrows, make sure there is a continuous path of bare soil connecting these basic needs.



Figure 32. Hatchlings are irresistible but difficult to raise properly. One female may lay 20 eggs each year.

REPRODUCTION AND HATCHLINGS

Adults' water dish. See *Making a Drinking Place*, Page 16.

Adults' burrows. If a hatchling wanders into an adult's burrow, it may be squashed accidentally. **There must be conveniently placed burrows that are snug for hatchlings.** If the right sizes are available, the hatchlings prefer to use them.



Figure 33. Cats and well-trained dogs live compatibly with tortoises.

Dogs. Be watchful. Don't expect a puppy to keep away from hatchlings. An older dog that may not bother a large tortoise may injure or kill a small tortoise, just by picking it up in its mouth. See *How to Introduce a Dog*, Page 8.

Children want to play with small tortoises or carry them around. This should not be permitted. One reason is heat stress. Small tortoises heat up quickly and need to cool off frequently. They must be given this opportunity. Only **they** know when it is time to leave the sunlight and seek shelter. As few as 15 minutes of forced exposure to the sun in hot weather may cause death from overheating. The tortoise cannot move to the shade if it is being held or confined in the sunlight. An adult should supervise the handling of tortoises by children.

Setting Aside Part of the Yard for Hatchlings

Hatchlings need a lot of area, more than you might think for their size. If you must give them a separate area, it should be at least 100 square feet for one to four hatchlings and should be enlarged after the first year. It is important to make the enclosure longer than it is wide (at least 5' x 20'). This allows enough separation between the burrow end that should stay dry and the damp area at the other end for water and growing food. See *Building a Hatchling Enclosure*, Page 23.

*As far as we know,
a female lays eggs
for her entire adult life.*

Build the enclosure where it will receive direct sunlight most of the day, especially in the spring and fall. Areas on the sides of most houses are usually too narrow to provide enough direct sunlight. Do not use the side of a building or the property boundary walls as sides of the baby pen. Those walls will radiate a great deal of heat. See *Select a Location for the Burrow*, Page 9.



Figure 34. A hatchling pen keeps babies safe until the entire yard is baby-safe.

REPRODUCTION AND HATCHLINGS

Building a Hatchling Enclosure

Hatchlings must not be able to see through the side of an enclosure, so we suggest walls of cinder block. The walls need be only two cinder blocks high, plus an important single top row of “half blocks” 16” x 7 1/2” x 3 1/2” – wider than the top of the cinder blocks.

Place the half-blocks so they hang over the inner edges of the cinder blocks, as in Figure 35. This will prevent escape, and hatchlings will try. They have long nails and will climb up the corners and escape or fall into the holes in the cinder blocks and die if they are not covered. Covering the cinder blocks also makes the enclosure more attractive and good for sitting.



Figure 35. Cinder block structure topped with overlapping half blocks prevents escape. Reed mat shades the water dish at the irrigated end of the enclosure.

1. Stack two courses of cinder blocks without mortar to create an enclosure at least 5' x 20', or 100 square feet.
2. Create the overhang using a single row of solid half blocks placed so they hang over the inner edge of the cinder blocks.
3. Build a burrow for each hatchling using rounded rake roof tiles, different from regular roof tiles. See Figure 36 and Information Sheet #14.

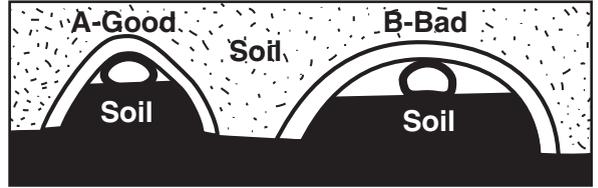


Figure 36. Rounded rake tile, A, provides snug fit for good insulation. Compare to B, which allows easy entry of hot air and breezes that dehydrate.

- a. Use two or three ceramic roof tiles set end-to-end in a downward-sloping trench filled with rock-free soil. Cover each seam between the tiles with a strip of plastic.
 - b. Use a broom handle to create a channel that is just large enough for the tortoise to move the entire length of the burrow. With the broom handle, pack down the soil just enough to create a firm surface for the juvenile to walk easily and not sink into the soil. See Figure 37.
 - c. Cover the tiles with at least 18–24" of soil with high water-holding capacity, not sand or gravel. Pack down the soil firmly.
 - d. Beyond the end of the burrow, create a pile of rock-free, well-packed soil that you know will hold its shape when the juvenile attempts to extend the burrow and/or create a turnaround. You can test this with your hand. This pile should extend at least two feet beyond the burrow, be two feet wide, and as high as the soil covering the tiles.
4. On the end of the pen to be irrigated, use soil with added organic matter for growing food plants. See Figure 35.
 - a. Plant a small patch of common Bermuda grass and keep it very short. Transplant dandelions and low perennial ornamentals listed under *Food* and on Information Sheet #21.

REPRODUCTION AND HATCHLINGS



Figure 37. Rounded rake roof tiles at the dry end of the enclosure make snug burrows for hatchlings.

- b. For the water dish use a new, unglazed, red clay dish, 4-5" in diameter set in the ground as described under *Making a Drinking Place*, Page 16. Make sure the tortoises can stand in the water with no water over their noses. Add pebbles to the bottom to make the water shallower, if necessary. Place the dish in one corner just far enough from the wall that the tortoises can easily walk behind it.
- c. Build a small shade cover over the dish with 3-4" legs, following the style and photos on Page 16 and in Information Sheet #16. A triangular cover could go across the corner of the half blocks.

Hatchlings like to walk the edges of the enclosure. Keep a path along the base of the blocks free of rocks or plants that the tortoise would tend to climb over and possibly fall on its back. In fact leave rocks out of the enclosure. Do not use overturned cinder blocks as a kind of shelter, as they are not adequate and tortoises can eventually become stuck and die in the heat.

Hatchling Hibernation

In the desert, even hatchlings hibernate outdoors the first winter. Indoors there is a risk of dehydration and death. However, sometimes it is necessary to provide a cold place for hibernation if the hatchling enclosure and burrows are not ready. Since the proper substitute in a cold place is very important, see Page ii for securing Information Sheet #15.

Giving Away Hatchlings

Hatchlings are harder to take care of than larger tortoises. It is difficult to see beyond the tremendous appeal of a baby tortoise. People may want to take one immediately, before their yard is ready. They may have the mistaken idea that hatchlings are too small and fragile to live outside and must live in a terrarium indoors. This is not true. They need a good outdoor habitat to be healthy.



Figure 38. Dandelions! Choice food for tortoises of all ages.

Give these people a copy of this pamphlet to read, first. People who do not want to wait until their yards are ready do not realize what is involved in responsible care. Preparation takes time and, unfortunately, people procrastinate. As a result, many babies end up in a terrarium in a

REPRODUCTION AND HATCHLINGS

child's bedroom, suffering from soft-shell disease and dying slowly. You can prevent this with your hatchlings.

The law. Since August 1989, wild tortoises and tortoises hatched in captivity are equally protected under the Endangered Species Act. The proper outdoor environment is a major part of responsible care. Please see that an outdoor habitat is ready before you give away your tortoises.



Figure 39. *Tortoises sometimes eat soil, possibly for the minerals.*

If you are not able to see that habitats are ready in advance, call us at (702) 739-7113 and give us the names of prospective adopters. We will handle those adoptions. If you have no prospective homes for your hatchlings, the Tortoise Pick-up Service, (702) 593-9027, will take them *if* you are willing to practice the only practical form of birth control we have for tortoises, separating the sexes permanently.

Birth control. A pet female tortoise may produce more than 16 hatchlings a year. Most people with breeding tortoises eventually run out of room or good homes where hatchlings will receive responsible care. We are asking people with reproducing females to use the same kind of responsible pet ownership that they have learned with cats and dogs.

Spaying and neutering has reduced the number of unwanted dogs and cats that must be euthanized. However, healthy tortoises are not euthanized and it is impractical to spay or neuter them. The cost of maintaining hundreds of tortoises each year at the Desert Tortoise Holding Facility is considerable, and we believe that it is the pet owners who should be responsible for controlling hatchling numbers. Unless tortoises are part of an authorized release program, they are not to be released in the desert. Therefore, think seriously if you have a mating pair. You can expect as many as 20 hatchlings each year.

The Tortoise Pick-up Service will take your unwanted hatchlings if you have done your part to stop reproduction. If your yard is large enough, you could create separate habitats for the male and female. Or, you may keep one adult and turn over the remaining tortoises.

Because females store sperm, expect a female to lay fertile eggs for several years after being separated from a male. The staff at the Pick-up Service will take your unwanted hatchlings if you have separated breeding adults permanently.

Tortoises are naturally loners. Keeping just one tortoise is a good solution.



Figure 40. *Single pet tortoises appear content to live without other tortoises.*

HIBERNATION/BRUMATION

Before hibernation (brumation) occurs, behavioral changes take place in your tortoise over a period of weeks. By September and October it will eat less. Be sure to offer a drink and a soak in the water dish or basin. The tortoise will spend more and more time in the winter burrow until it no longer emerges.

LOCATION & TEMPERATURE

The best place for both hatchlings and larger tortoises to hibernate is in an underground burrow several body lengths long. Burrows should keep the tortoises from overheating in summer and freezing in winter.

Only in an outdoor setting can the fall and spring adjustment periods proceed normally. In winter, most indoor temperatures are too warm and dry to slow the metabolism at a time when a tortoise normally does not eat and is programmed to sleep. A tortoise kept too warm in winter may be dehydrated, debilitated, or dead by spring. Temperatures from 35-50 degrees Fahrenheit are needed during the winter.

Substitutes for an outdoor burrow (see Information Sheet #15) are likely to be too warm, too dry, or dangerous. For example, a storage shed or garage may be too warm in early fall and late winter. If the tortoise is free to walk about, it may become caught among stored items or come to rest in the path of vehicles.

If you confine the tortoise to a box where you cannot check it easily and often, the tortoise may tip over or become very stressed trying to get out. In the fall the tortoise may not be ready for confinement in a box when **you** choose. In the spring, the tortoise may awaken and become active earlier than you expect.

If you must provide a substitute wintering place, see that the temperature

1. Use a cardboard box with several sheets of newspaper on the bottom. **Do not use towels – toenails tangle easily in towels.** stays between 35 and 50 degrees F.
2. Place thermometer on the floor of the box.
3. Cover the box with a partly open lid. Place it on the floor where it won't fall if the tortoise tries to climb out. Make it a convenient location for you to check the tortoise and temperature occasionally and hear any restlessness. See Page ii for securing Information Sheet #15 on alternative locations for hibernation for tortoises of all ages.

Winter construction. If you are constructing a burrow in winter, we can check if for you when it is complete. You can move the tortoise into it as soon as the burrow is ready, even in winter!

Emerging in the spring. In March and April, the tortoise comes out of the burrow with increasing frequency and basks for a few hours. It may not return to the cold burrow but choose superficial cover like a corner or under a shrub. Do not be concerned. Your tortoise will know when to use its burrow.

Eating and other activities may not start for days or weeks. On a warm day, offer a drink and soak in lukewarm, very shallow water. Dry the tortoise well afterward. When the tortoise starts walking about and eating plants, that is the signal to start offering MegaDiet.

The day that a tortoise starts to hibernate in the fall and emerge from the burrow for the first time in the spring varies with each tortoise and may change from year to year. It may have little to do with the amount of daylight in 24 hours or the increasing temperatures, and more to do with the tortoise's internal (biological) clock.

MEDICAL PROBLEMS

Tortoise Group can provide you with a list of veterinarians in the Las Vegas area who have experience treating tortoises. See Page ii for securing Information Sheet #24.

ACCIDENTS AND INJURIES

The most common accidents that result in death or injury are preventable. They include dog attacks, attempts to climb or get through wire fencing, tipping over, getting caught when climbing over stored items, falling into swimming pools, and being hit by a car because the yard was not secure and the tortoise escaped. Even though tortoises have amazing ability to heal, we suggest you seek veterinary help. Even superficial wounds should be treated, because a maggot infestation can be more of a threat than the injury.

If you have an unfenced swimming pool or pond, be prepared in advance in the event of drowning. See Page ii for securing Information Sheet #25, *Drowning and Resuscitation*. There are first aid instructions that may save the tortoise's life. A tortoise that appears dead may not be dead. If you have one tortoise, there is much less chance it will fall in the pool than if there are two interacting in any way near water.

RESPIRATORY

Upper respiratory tract disease (URTD) is common and may be life threatening. Signs include runny or blocked nostrils, difficulty breathing, runny eyes, puffed lids, and loss of appetite. URTD is communicable among tortoises. Predisposing causes are usually stress related and may include improper diet, excess humidity, and crowding. Antibiotics may eliminate the signs and prevent pneumonia and death.

The condition may become chronic. Some tortoises live a long and otherwise normal life but remain carriers of URTD. We suggest early veterinary help.

GASTROINTESTINAL

Soil and pebbles are sometimes eaten by both pet and wild tortoises. The need for minerals may be one reason. This does not necessarily cause problems, but impactions in pet tortoises have been associated with eating pebbles.

Intestinal parasites are a hidden problem increased when the tortoise eats sweet fruits and corn. Have your tortoise checked by a vet. To control the severity of infestation and the chance of reinfestation, collect the droppings (scats) often and discard them.

Salmonella. Washing hands after handling tortoises can help prevent the spread of Salmonella that is often present in tortoises. Small children are especially at risk, because they tend to put their fingers in their mouths. Small children should not handle tortoises. See Page ii for securing Information Sheet #26 on *Salmonella*.

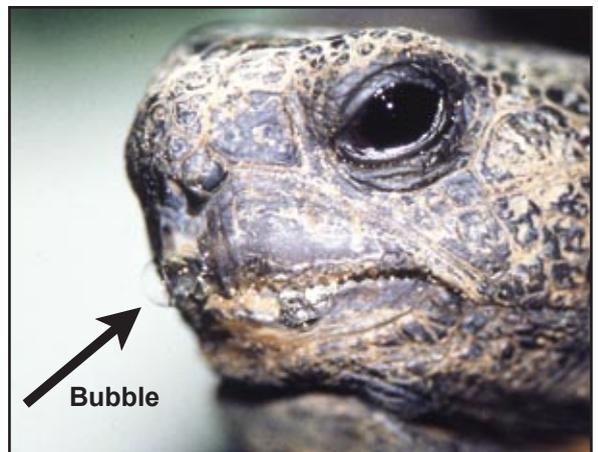


Figure 41. Look closely: this tortoise is blowing a bubble, a sign of upper respiratory tract disease that can kill or become chronic.

HOW TORTOISE GROUP HELPS

MISSION

Tortoise Group supports measures to protect free-living tortoises and their habitat. By offering homeless pet tortoises for adoption, we hope to stop the poaching of wild, protected tortoises.

Tortoise Group is concerned with the quality of life of pet tortoises and promotes responsible care. Tortoises, as pets, are particularly easy to neglect and abuse. Improper care has been demonstrated to us over the years by the hundreds of observed and reported instances of deformity and death among tortoises.

MEETINGS AND SERVICES

Meetings

Our meetings are for the general public. Meetings are an enjoyable way of learning more about wild and pet desert tortoises and sharing tortoise stories. We feature guest speakers, sell *MegaDiet* and other items, and offer free information sheets. See the list on Page ii. Call us for the meeting schedule (702-739-7113) or visit our Website at: <http://www.tortoisegroup.org>

Marking Your Tortoise

We can show you a harmless way to mark your tortoise with your phone number. See Figure 42 and Page ii for securing Information Sheet #5. We can also insert a microchip in your tortoise. The phone number and/or microchip may mean the difference between your lost tortoise being returned or not.

Never drill holes through the shell. There are nerves and blood vessels under the entire shell. Drilling causes pain and serves no purpose.

Many pet tortoises escape each year. If you lose yours, call the Tortoise Pick-up Service, (702) 593-9027. It may have collected the tortoise.

Never cover the shell with paint or similar material. Trying to remove it can do more harm than good. Paint will eventually wear off.



Figure 42. If your tortoise escapes, this harmless identification with your phone number may make the difference in recovering your tortoise or not.

Additional Free Services

- ◆ Speakers for school classes, youth and adult groups
- ◆ Newsletter
- ◆ Hotline: (702) 739-7113
- ◆ Personalized assistance on tortoise matters
- ◆ Website: <http://www.tortoisegroup.org>

- Questions or concerns about your tortoise?
- Need a yard consultation?
- Want to adopt a tortoise?

Call Tortoise Group at
(702) 739-7113

Printing through
the generous
contribution of

