Physical Fitness
(Preparation for Wilderness)

The following information has been researched and compiled by the author and owner of BGMA. It is not intended to diagnose or treat any symptoms of stress or fatigue. The author has studied this area of survival for well over 10 years and is keen to pass on his knowledge and understanding of the mind and body in survival situations.

Physical fitness is the ability to function effectively in physical work, training, and other activities and still have enough energy left over to handle any emergencies which may arise.

If you feel physically capable of dealing with a situation you WILL be able to succeed.

The components of physical fitness are as follows:

- Cardio respiratory (CR) endurance - the efficiency with which the body delivers oxygen and nutrients needed for muscular activity and transports waste products from the cells.
- Muscular strength - the greatest amount of force a muscle or muscle group can exert in a single effort.
- Muscular endurance - the ability of a muscle or muscle group to perform repeated movements with a sub-maximal force for extended periods of time.
- Flexibility - the ability to move the joints (for example, elbow, knee) or any group of joints through an entire, normal range of motion.
- Body composition - the amount of body fat a person has in comparison to his total body mass.

Improving the first three components of fitness listed above will have a positive impact on body composition and will result in less fat. Excessive body fat detracts from the other fitness components, reduces performance, detracts from appearance, and negatively affects one's health.

Factors such as speed, agility, muscle power, eye-hand coordination, and eye-foot coordination are classified as components of "motor" fitness. These factors affect a person's survivability in the wilderness. Appropriate training can improve these factors within the limits of each person's potential.

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Adherence to certain basic exercise principles is important for developing an effective program. The principles of exercise apply to everyone at all levels of physical training, from the Olympic-caliber athlete to the weekend jogger. They also apply to fitness training for military personnel.

These basic principles of exercise must be followed:

- Regularity. To achieve a training effect, a person must exercise of ten. One should strive to exercise each of the first four fitness components at least three times a week. Infrequent exercise can do more harm than good. Regularity is also important in resting, sleeping, and following a good diet.

- Progression. The intensity (how hard) and/or duration (how long) of exercise must gradually increase to improve the level of fitness.

- Balance. To be effective, a program should include activities that address all the fitness components, since overemphasizing any one of them may hurt the others.

- Variety. Providing a variety of activities reduces boredom and increases motivation and progress.

- Specificity. Training must be geared toward specific goals. For example, people become better runners if their training emphasizes running. Although swimming is great exercise, it does not improve a 2-mile-run time as much as a running program does.

- Recovery. A hard day of training for a given component of fitness should be followed by an easier training day or rest day for that component and/or muscle group(s) to help permit recovery. Another way to allow recovery is to alternate the muscle groups exercised every other day, especially when training for strength and/or muscle endurance.

- Overload. The work load of each exercise session must exceed the normal demands placed on the body in order to bring about a training effect.

Certain factors must be part of any fitness training program for it to be successful. These factors are Frequency, Intensity, Time, and Type. The acronym FITT makes it easier to remember them.

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Factors for a successful training program are Frequency, Intensity, Time, and Type; "FITT".

FITT Factors Applied to Physical Conditioning Program					
	Cardio-respiratory Endurance	**Muscular Strength**	**Muscular Endurance**	**Muscular Strength and Muscular Endurance**	**Flexibility**
Frequency	3 - 5 times per week	3 times per week	3 - 5 times per week	3 times per week	<u>Warm up and cool down:</u> Stretch before and after each exercise session <u>Developmental Stretching:</u> To improve flexibility stretch 2-3 times/week
Intensity	50 - 90% HRR*	3 - 7 RM*	12+ RM	8 - 12 RM	Tension and slight discomfort, NOT PAIN.
Time	20 minutes of more	The time required to do 3 - 7 repetitions of each exercise	The time required to do 12+ repetitions of each exercise	The time required to do 8 - 12 repetitions of each exercise	<u>Warm up and cool down stretches:</u> 10 - 15 seconds per stretch <u>Developmental Stretching:</u> 20 - 40 seconds per stretch
Type	Running Swimming Cross Country Skiing Rowing Bicycling Jumping Rope Walking Hiking	Free Weights Resistance Machines Body-Weight Exercises (Push-ups/Sit-ups/Pull-ups/Dips, etc.)			<u>Stretching:</u> Static Passive P.N.F.
*HRR - Heart Rate Reserve *RM - Repetition Maximum					

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Frequency

Vigorous physical fitness training should be conducted 3 to 5 times per week. For optimal results, one should strive to conduct 5 days of physical training per week. Ideally, at least three exercise sessions for CR fitness, muscle endurance, muscle strength, and flexibility should be performed each week to improve fitness levels. Thus, for example, to obtain maximum gains in muscular strength, one should have at least three strength-training sessions per week. Three physical activity periods a week, however, with only one session each of cardio-respiratory, strength, and flexibility training will not improve any of these three components.

With some planning, a training program for the average person can be developed which provides fairly equal emphasis on all the components of physical fitness. The following training program serves as an example.

In the first week, Monday, Wednesday, and Friday are devoted to CR fitness, and Tuesday and Thursday are devoted to muscle endurance and strength. During the second week, the training days are flip-flopped: muscle endurance and strength are trained on Monday, Wednesday, and Friday, and CR fitness is trained on Tuesday and Thursday. Stretching exercises are done in every training session to enhance flexibility. By training continuously in this manner, equal emphasis can be given to developing muscular endurance and strength and to CR fitness while training five days per week.

In certain circumstances, some muscular and some CR training can be done during each daily training session as long as a "hard day/recovery day" approach is used. For example, if one has a hard run on Monday, Wednesday, and Friday, one may also choose to run on Tuesday and Thursday. However, on Tuesday and Thursday the intensity and/or distance/time should be reduced to allow recovery. Depending on the time available for each session and the way training sessions are conducted, all components of fitness can be developed using a three-day-per-week schedule. However, a five-day-per-week program is much better than three per week.

Numerous other approaches can be taken when tailoring a fitness program to meet one's goals as long as the principles of exercise are not violated. Such programs, when coupled with good nutrition, will help keep one fit to win.

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Intensity

Training at the right intensity is the biggest problem in most exercise programs. The intensity should vary with the type of exercise being done. Exercise for CR development must be strenuous enough to elevate the heart rate to between 60 and 90 percent of the heart rate reserve (HRR). (The calculation of percent HRR is explained in Chapter 2) Those with low fitness levels should start exercising at a lower training heart rate (THR) of about 60 percent of HRR.

For muscular strength and endurance, intensity refers to the percentage of the maximum resistance that is used for a given exercise. When determining intensity in a strength-training program, it is easier to refer to a "repetition maximum" or "RM." For example, a 10-RM is the maximum weight that can be correctly lifted 10 times. An 8-12 RM is the weight that can be lifted 8 to 12 times correctly. Doing an exercise "correctly" means moving the weight steadily and with proper form without getting help from other muscle groups by jerking, bending, or twisting the body. For the average person who wants to improve both muscular strength and endurance, an 8-12 RM is best.

The person who wants to concentrate on muscular strength should use weights which let him do three to seven repetitions before his muscles fatigue. Thus, for strength development, the weight used should be a 3-7 RM. On the other hand, the person who wants to concentrate on muscular endurance should use a 12+ RM. When using a 12+ RM as the training intensity, the more repetitions performed per set, over time, the greater will be the improvement in muscular endurance. Conversely, the greater the number of repetitions performed, the smaller will be the gains in strength. For example, a person who regularly trains with a weight which lets him do 100 repetitions per exercise (a 100-RM) greatly increases his muscular endurance but minimally improves his muscular strength.

All exercise sessions should include stretching during the warm-up and cool-down. One should stretch so there is slight discomfort, but no pain, when the movement is taken beyond the normal range of motion.

Time

Like intensity, the time spent exercising depends on the type of exercise being done. At least 20 to 30 continuous minutes of intense exercise must be used in order to improve cardio respiratory endurance.

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For muscular endurance and strength, exercise time equates to the number of repetitions done. For most people, 8 to 12 repetitions with enough resistance to cause muscle failure improves both muscular endurance and strength. As people progress, they will make better strength gains by doing two or three sets of each resistance exercise.

Flexibility exercises or stretches should be held for varying times depending on the objective of the session. For warming-up, such as before a run, each stretch should be held for 10 to 15 seconds. To improve flexibility, it is best to do stretching during the cool-down, with each stretch held for 30 to 60 seconds. If flexibility improvement is a major goal, at least one session per week should be devoted to developing it.

Type

Type refers to the kind of exercise performed. When choosing the type, one should consider the principle of specificity. For example, to improve one's level of CR fitness (the major fitness component in the 2-mile run), one should do CR types of exercises.

The basic rule is that to improve performance, one must practice the particular exercise, activity, or skill he wants to improve. For example, to be good at push-ups, one must do push-ups. No other exercise will improve push-up performance as effectively.

One must prepare the body before taking part in organized PT, unit sports competition, or vigorous physical activity. A warm-up may help prevent injuries and maximize performance. The warm-up increases the body's internal temperature and the heart rate. The chance of getting injured decreases when the heart, muscles, ligaments, and tendons are properly prepared for exertion. A warm-up should include some running-in-place or slow jogging, stretching, and calisthenics. It should last five to seven minutes and should occur just before the CR or muscular endurance and strength part of the workout. After a proper warm-up, one is ready for a more intense conditioning activity.

One should cool down properly after each exercise period, regardless of the type of workout. The cool-down serves to gradually slow the heart rate and helps prevent pooling of the blood in the legs and feet. During exercise, the muscles squeeze the blood through the veins. This helps return the blood to the heart. After exercise, however, the muscles relax and no longer do this, and the blood can accumulate in the legs and feet. This can cause a person to faint. A good cool-down will help avoid this possibility.

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One should walk and stretch until their heart rates return to less than 100 beats per minute (BPM) and heavy sweating stops. This usually happens five to seven minutes after the conditioning session.

Phases of Fitness Conditioning

The physical fitness training program is divided into three phases: preparatory, conditioning, and maintenance. The starting phases for different individuals vary depending on their age, fitness levels, and previous physical activity.

Young, healthy persons may be able to start with the conditioning phase, while those who have been exercising regularly may already be in the maintenance phase. Many factors such as illness or lack of consistency in one's exercise program can cause individuals to drop from a maintenance to a conditioning phase. Persons who have not been active, especially if they are age 40 or older, should start with the preparatory phase.

Preparatory Phase

The preparatory phase helps both the cardio respiratory and muscular systems get used to exercise, preparing the body to handle the conditioning phase. The work load in the beginning must be moderate. Progression from a lower to a higher level of fitness should be achieved by gradual, planned increases in frequency, intensity, and time.

Initially, poorly conditioned individuals should run, or walk if need be, three times a week at a comfortable pace that elevates their heart rate to about 60 percent HRR for 10 to 15 minutes. Recovery days should be evenly distributed throughout the week, and training should progress slowly. People should continue at this or an appropriate level until they have no undue fatigue or muscle soreness the day following the exercise. They should then lengthen their exercise session to 16 to 20 minutes and/or elevate their heart rate to about 70 percent HRR by increasing their pace. To be sure their pace is faster, they should run a known distance and try to cover it in less time. Those who feel breathless or whose heart rate rises beyond their training heart rate (THR) while running should resume walking until the heart rate returns to the correct training level. When they can handle an intensity of 70 percent HRR for 20 to 25 minutes, they should be ready for the next phase.

The preparatory phase for improving muscular endurance and strength through weight training should start easily and progress gradually. Beginning weight trainers should select about 8 to 12 exercises that work all the body's major muscle groups. They should use only very light weights the first week (that is, the first two to three workouts).

This is very important, as they must first learn the proper form for each exercise. Light weights will also help minimize muscle soreness and decrease the likelihood of injury to the muscles, joints, and ligaments.

During the second week, they should use progressively heavier weights on each resistance exercise. By the end of the second week (four to six workouts), they should know how much weight will let them do 8 to 12 repetitions to muscle failure for each exercise. At this point the conditioning phase begins.

Conditioning Phase

To reach the desired level of fitness, people must increase the amount of exercise and/or the workout intensity as their strength and/or endurance increases.

To improve cardio respiratory endurance, for example, they must increase the length of time they run. They should start with the preparatory phase and gradually increase the running time by one or two minutes each week until they can run continuously for 20 to 30 minutes. At this point, they can increase the intensity until they reach the desired level of fitness. They should train at least three times a week and take no more than two days between workouts.

For weight trainers, the conditioning phase normally begins during the third week. They should do one set of 8 to 12 repetitions for each of the selected resistance exercises. When they can do more than 12 repetitions of any exercise, they should increase the weight used on that exercise by about five percent so they can again do only 8 to 12 repetitions. This process continues throughout the conditioning phase. As long as they continue to progress and get stronger while doing only one set of each exercise, it is not necessary for them to do more than one set per exercise. When they stop making progress with one set, they should add another set on those exercises in which progress has slowed. As training progresses, they may want to increase the sets to three to help promote further increases in strength and/or muscle mass.

For maximum benefit, weight trainers should do strength training three times a week with 48 hours of rest between workouts for any given muscle group. It helps to periodically do a different type of exercise for a given muscle or muscle group. This adds variety and ensures better strength development.

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Maintenance Phase

The maintenance phase sustains the high level of fitness achieved in the conditioning phase. The emphasis here is no longer on progression. A well-designed, 45- to 60-minute workout (including warm-up and cool-down) at the right intensity three times a week is enough to maintain almost any appropriate level of physical fitness.

These workouts give one the time to stabilize their flexibility, CR endurance, and muscular endurance and strength. However, more frequent training may be needed to reach and maintain peak fitness levels.

An effective program uses a variety of activities to develop muscular endurance and strength, CR endurance, and flexibility, and to achieve good body composition. It should also promote the development of coordination as well as basic physical skills.

Age As A Factor In Physical Fitness

People undergo many changes as they grow older. For example, the amount of blood the heart can pump per beat and per minute decreases during maximal exercise, as does the maximum heart rate. This lowers a person's physical ability, and performance suffers. Also, the percent of body weight composed of fat generally increases, while total muscle mass decreases. The result is that muscular strength and endurance, CR endurance, and body composition suffer. A decrease in flexibility also occurs.

Men tend to maintain their peak levels of muscular strength and endurance and CR fitness until age 30. After 30 there is a gradual decline throughout their lives. Women tend to reach their peak in physical capability shortly after puberty and then undergo a progressive decline.

Although a decline in performance normally occurs with aging, those who stay physically active do not have the same rate of decline as those who do not. Decreases in muscular strength and endurance, CR endurance, and flexibility occur to a lesser extent in those who regularly train these fitness components.

People who are fit at age 40 and continue to exercise show a lesser decrease in many of the physiological functions related to fitness than do those who seldom exercise. A trained 60-year-old, for example, may have the same level of CR fitness as a sedentary 20-year-old. In short, regular exercise can help add life to your years and years to your life.